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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,364	08/20/2001	Paul H. Gailus	CM04766H	7135

22917 7590 05/17/2006

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EXAMINER	
HASHEM, LISA	
ART UNIT	**PAPER NUMBER**
2614	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/933,364	GAILUS ET AL.	
	Examiner	Art Unit	
	Lisa Hashem	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-9,11-18,20 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9, 11-18, 20 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 8, 9, 11, 18, and 20 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. Patent No. 6,275,685 by Wessel et al, hereinafter Wessel.

Regarding claim 1, Wessel discloses in an electrical device generating a

variable output signal (col. 5, lines 20-22; Fig. 4; col. 6, lines 35-41),

a feedback loop for adjusting the variable output signal (Fig. 4: 50, 54, 82/84, 92/94),

the feedback loop having an input for receiving an input signal (Fig. 4, 10),

an output for outputting the variable output signal (Fig. 4, 28) and

a loop bandwidth associated with a forward path (col. 6, lines 35-41; col. 10, line 25 – col. 11, line 35) and a feedback path of the feedback loop (col. 6, line 63 – col. 7, line 11; col. 8, lines 9-33), the feedback loop comprising:

a power amplifier coupled to the output of the feedback loop in the forward path of the feedback loop (Fig. 4, 22);

at least one adjustable zero element coupled between the input of the feedback loop (Fig. 4, 14) and the power amplifier (Fig. 4, 22); and

at least one adjustable pole element coupled between the input of the feedback loop and the power amplifier;

wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop

(Fig. 4, 70; col. 6, line 39 – col. 7, line 12; col. 7, line 66 – col. 9, line 29).

Regarding claim 8, the feedback loop of claim 1, wherein Wessel further discloses the adjustable pole element is a circuit comprising a plurality of elements having impedance that can be selectively coupled to other elements of the circuit (Fig. 6; col. 6, line 39 – col. 7, line 12; col. 7, line 66 – col. 9, line 29; col. 10, line 25 – col. 11, line 35).

Regarding claim 9, the feedback loop of claim 1, wherein Wessel further discloses the at least one adjustable pole element and the at least one adjustable zero element are substantially contained within an integrated circuit (Fig. 6; col. 6, line 39 – col. 7, line 12; col. 7, line 66 – col. 9, line 29; col. 10, line 25 – col. 11, line 35).

Regarding claim 11, the feedback loop of claim 1, wherein Wessel further discloses the at least one adjustable pole element comprises two adjustable pole elements (col. 10, line 25 – col. 11, line 35).

Regarding claim 18, Wessel discloses an integrated circuit implementing substantially all the components of a feedback loop with adjustable frequency response, the integrated circuit the feedback loop of claim 1 (Fig. 4).

Regarding claim 20, Wessel discloses a feedback loop (Fig. 4: 50, 54, 82/84, 92/94) having an input for receiving an input signal (Fig. 4, 10), an output for outputting a variable output signal (Fig. 4, 28) and a loop bandwidth associated with a forward path and a feedback path of the feedback loop (col. 6, lines 35-41; col. 10, line 25 – col. 11, line 35), the feedback loop comprising:

a power amplifier coupled to the output of the feedback loop in the forward path of the feedback loop (Fig. 4, 22);

at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ();

at least one adjustable pole element coupled between the input of the feedback loop (Fig. 4, 14) and the power amplifier (Fig. 4, 22) in the forward path of the feedback loop;

a first mixer (Fig. 4, 16) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier;

and a second mixer (Fig. 6, 754) in the feedback loop of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (Fig. 4, 70; col. 6, line 39 – col. 7, line 12; col. 7, line 66 – col. 9, line 29; col. 8, lines 42-63).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2, 4, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wessel as applied to claim 1 above, and further in view of Cahill.

Regarding claim 2, Wessel does not disclose the at least one adjustable zero element is in the forward path of the feedback loop.

Cahill discloses in an electrical device (see Fig. 1) having a variable output (col. 2, line 32 – col. 3, line 4), a feedback loop for adjusting the variable output, the feedback loop having a characteristic bandwidth (col. 4, lines 17-54; Fig. 1; Fig. 4) and comprising:

at least one adjustable zero element and at least one adjustable pole element (col. 3, lines 5-30); whereby the at least one adjustable zero element and at least one adjustable pole element are operable to change the characteristic bandwidth of the feedback loop (col. 3, lines 20-50).

Wherein Cahill further discloses the at least one adjustable zero element is in the forward path of the feedback loop (Fig. 1: 113, 115; col. 3, lines 20-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Wessel to include the at least one adjustable zero element is in the forward path of the feedback loop as taught by Cahill. One of ordinary skill in the art would have been lead to make such a modification to provide a means for changing the frequency response of the forward path of the feedback loop so that the bandwidth of the loop can be changed in a manner that retains stability.

Regarding claim 4, the feedback loop of claim 1, wherein Wessel does not disclose the at least one adjustable pole element is in the forward path of the feedback loop.

Cahill discloses in an electrical device (see Fig. 1) having a variable output (col. 2, line 32 – col. 3, line 4), a feedback loop for adjusting the variable output, the feedback loop having a characteristic bandwidth (col. 4, lines 17-54; Fig. 1; Fig. 4) and comprising:

at least one adjustable zero element and at least one adjustable pole element (col. 3, lines 5-30);

whereby the at least one adjustable zero element and at least one adjustable pole element are operable to change the characteristic bandwidth of the feedback loop (col. 3, lines 20-50).

Wherein Cahill further discloses the at least one adjustable pole element is in the forward path of the feedback loop (Fig. 1: 113, 115; col. 3, lines 20-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Wessel to include the at least one adjustable pole element is in the forward path of the feedback loop as taught by Cahill. One of ordinary skill in the art would have been lead to make such a modification to provide a means for changing the frequency response of the forward path of the feedback loop so that the bandwidth of the loop can be changed in a manner that retains stability.

Regarding claim 5, the feedback loop of claim 4, wherein Wessel further discloses the at least one adjustable zero element is in the forward path of the feedback loop, the feedback loop further comprising: a mixer (Fig. 4, 16) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; a mixer (Fig. 6, 754) in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop (col. 8, lines 42-63).

Regarding claim 6, the feedback loop of claim 5, wherein Wessel further discloses: the feedback loop is used as part of a radio transmitter (col. 5, lines 20-22).

3. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wessel as applied to claim 1 above, and further in view of Wray.

Regarding claim 7, the feedback loop of claim 3, wherein Wessel does not disclose the feedback loop is a Cartesian feedback loop (Fig. 4).

Wray discloses a Cartesian feedback loop wherein an amplifier circuit has an amplifier control loop and a loop closing element for selectively opening and closing the control loop in response to a loop closing signal (see Abstract; Fig. 1; Fig. 2; col. 2, line 50 – col. 3, line 20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Wessel to include the feedback loop is a Cartesian feedback loop as taught by Wray. One of ordinary skill in the art would have been lead to make such a modification since a Cartesian feedback loop is one method for linearizing the output of a power amplifier.

Regarding claim 12, the feedback loop of claim 1, in which Wessel does not disclose the adjustable element comprises:

an adjustable first amplifier that amplifies an input signal to the adjustable zero element to create a first amplified signal;

a second amplifier that amplifies the input signal to the adjustable zero element to create a second amplified signal;

a low pass filter that operates on the first amplified signal to create a filtered amplified signal; and a summer to add the filtered amplified signal and the second amplified signal to create an output signal to the adjustable zero element.

Wray discloses in a feedback loop having a loop and a closed loop frequency response (see Abstract; Fig. 2), the closed loop frequency response being characterized by a closed loop bandwidth (col. 2, lines 46-56), a method comprising steps of: having a larger gain (Fig. 2, 102) in the loop frequency response yielding a change in the closed loop frequency response (col. 3, lines 21-63).

Wherein Wray further discloses an adjustable first amplifier (Fig. 2, 105) that amplifies an input signal to create a first amplified signal; a second amplifier (Fig. 2, 20) that amplifies the input signal to create a second amplified signal; a low pass filter (Fig. 2, 106) that operates on the first amplified signal to create a filtered amplified signal; and a summer (Fig. 2, 103) to add the filtered amplified signal and the second amplified signal to create an output signal (col. 3, lines 21-40).

an adjustable first amplifier (Fig. 2, 105) that amplifies an input signal to the adjustable zero element to create a first amplified signal;

a second amplifier (Fig. 2, 101) that amplifies the input signal to the adjustable zero element to create a second amplified signal;

a low pass filter (Fig. 2, 106) that operates on the first amplified signal to create a filtered amplified signal; and a summer (Fig. 2, 103) to add the filtered amplified signal and the second amplified signal to create an output signal to the adjustable zero element (col. 3, lines 21-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the adjustable zero element of Wessel to include the following elements: an adjustable first amplifier, a second amplifier, a low pass filter, and a summer as taught by Wray to be included in the adjustable zero element to provide an output. One of ordinary skill in the art would have been lead to make such a modification since the above elements of Wray can be included in the adjustable zero element in the feedback loop to provide a linearized output.

4. Claims 13-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wray in view of Wessel.

Regarding claim 13, Wray discloses in a feedback loop comprising an input for receiving

an input signal (Vi),

an output for outputting a variable output signal (Vo),

a power amplifier coupled to the output of the feedback loop in a forward path of the feedback loop (Fig. 2, 10),

at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop (Fig. 2, 106), and

the feedback loop further having a loop and a closed loop frequency response associated with the forward path and a feedback path of the feedback loop (see Abstract; Fig. 2),

the loop frequency response having at least one zero and the closed loop frequency response being characterized by a closed loop bandwidth,

a method comprising the steps of:

having a larger gain (Fig. 2, 102) in the loop frequency response yielding a change in the closed loop frequency response (col. 3, lines 8-63).

Wray does not disclose an adjustable pole element and

moving a pole in the loop frequency response using at least one adjustable pole element yielding a change in the closed loop frequency response.

Wessel discloses a feedback loop (Fig. 4: 50, 54, 82/84, 92/94) having an input for receiving an input signal (Fig. 4, 10), an output for outputting a variable output signal (Fig. 4, 28) and a loop bandwidth associated with a forward path and a feedback path of the feedback loop (col. 6, lines 35-41; col. 10, line 25 – col. 11, line 35), the feedback loop comprising:

a power amplifier coupled to the output of the feedback loop in the forward path of the feedback loop (Fig. 4, 22);

at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier in the forward path of the feedback loop ();

at least one adjustable pole element coupled between the input of the feedback loop (Fig. 4, 14) and the power amplifier (Fig. 4, 22) in the forward path of the feedback loop;

a first mixer (Fig. 4, 16) in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier;

and a second mixer (Fig. 6, 754) in the feedback loop of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop (Fig. 4, 70; col. 6, line 39 – col. 7, line 12; col. 7, line 66 – col. 9, line 29; col. 8, lines 42-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Wray to include an adjustable pole element as taught by Wessel. One of ordinary skill in the art would have been lead to make such a modification since an movable pole element can introduce a low frequency dominant pole and be moved to a different location to yield a change in the closed loop frequency response.

Regarding claim 14, the method of claim 13, wherein Wray in view of Wessel further disclose the step of moving a pole is accomplished by switching among a plurality of elements having different impedances (Wray: col. 3, lines 21-63).

Regarding claim 15, the method of claim 13, wherein Wray in view of Wessel further disclose the step of: moving a zero in the loop frequency response using the at least one

adjustable zero element (Fig. 2, 106) yielding a change in the closed loop frequency response (Wray: col. 3, lines 21-63).

Regarding claim 16, the method of claim 15, wherein Wray in view of Wessel further disclose the step of moving a zero is accomplished by adjusting an amplifier with an adjustable gain (Wray: Fig. 2, 102; col. 3, lines 21-40).

Regarding claim 17, the method of claim 13, wherein Wray in view of Wessel further disclose a power amplifier amplifies the input signal so that it can be transmitted over a radio channel (Wray: Fig. 2, 10; col. 3, lines 21-40).

Regarding claim 22, please see the rejections to claims 13 and 15 above, to reject the feedback loop in claim 22.

Response to Arguments

5. Applicant's arguments, see Amendment, filed 2-21-06, with respect to the rejection(s) of claim(s) 1, 2. 4-9, 11-18, 20, and 22 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made. Please see all rejection(s) above.

6. Accordingly, this action is **FINAL**.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- U.S. Patent No. 6,947,712 by Sun discloses a Cartesian feedback loop with a power amplifier to transmit broadband signals

9. Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Or faxed to:

(571) 273-8300 (for formal communications intended for entry)

Or call:

(571) 272-2600 (for customer service assistance)

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa Hashem whose telephone number is (571) 272-7542. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LH

lh
May 15, 2006

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